

## Chapter 4: Key Wildlife Habitats and their Conservation

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The distribution and abundance of Maryland's wildlife species are directly related to the condition and location of their habitats. While some species can be found in a variety of habitats, many are less adaptive and are restricted to one or relatively few habitats. This is especially true for the rarest and most vulnerable wildlife species, including the GCN wildlife species identified for Maryland (Chapter 3). These specific habitats, themselves, often exhibit a restricted distribution in Maryland. This distribution is influenced by the diversity of Maryland's five major east-west physiographic provinces: Lower Coastal Plain, Upper Coastal Plain, Piedmont, Ridge and Valley, and Allegheny Plateau. Maryland's latitude also supports the overlap of ranges for typically northern or southern species. Aquatic habitats also exhibit a wide range, from saline Atlantic Ocean and coastal bays, to brackish Chesapeake Bay estuary, to fresh water streams, rivers and ponds. This adds to Maryland's wildlife and habitat diversity, but also influences the somewhat limited distribution of certain wildlife species and their habitats (Lawrence 1984, Lawrence and Gross 1984, Fergus 2003).

Habitats that support GCN species are broadly referred to here as "Key Wildlife Habitats". These key wildlife habitats can be further divided into finer scale vegetative associations. The restricted or vulnerable associations that support unique assemblages of plant and animal species are referred to as "Rare Natural Communities". Maryland DNR's NHP tracks rare natural communities, as it does the individual rare plant and animal species throughout the state. A rare natural community can be rare for a number of reasons. It might represent a habitat on the northern or southern extent of its range, or be declining or vulnerable due to anthropogenic threats or natural causes.

These rare natural communities can also represent coarse-filter surrogates or umbrellas for little known wildlife species. This is particularly true for the thousands of invertebrate species that are poorly understood and studied. Identification and protection of these rare natural communities within key wildlife habitats can be an effective, more holistic approach to conservation by saving all the pieces, as part of "intelligent tinkering" espoused by Aldo Leopold in *A Sand County Almanac* (Leopold 1949). Since then, a large body of literature has developed, supporting this coarse-filter, community approach that evolved into "systems ecology".

### Identification of Key Wildlife Habitats

As with the process for identification of wildlife GCN species discussed in Chapter 3, Maryland's key wildlife habitats were identified through input, analysis, and review by DNR staff, scientific experts, and various stakeholders. For coarse-filter planning, information from the existing standardized ecoregion and vegetative classification systems was used, including the *Classification of the Vegetation Communities of Maryland: First Iteration – a subset of the International Classification of Ecological Communities: Terrestrial Vegetation of the United States* (Harrison 2004). Harrison's work was collapsed into fewer categories and augmented by comparison with other

classification systems, such as those found in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et. al. 1979), *A Land Use and Land Cover Classification System for use with Remote Sensor Data* (Anderson, et. al. 1976) and *Field List of the Birds of Maryland* (Robbins and Bystrak 1977). This resulted in an initial list of habitats important to wildlife in Maryland. This list was then cross-walked with NatureServe's Terrestrial Ecological Systems (Appendix 2) as suggested by the IAFWA committee to ensure regional and national consistency. DNR staff, with assistance from scientific experts, associated each GCN species with the list of wildlife habitats. The resulting habitat and associated species spreadsheet was refined and any missing data was supplied based on best available current information. Stakeholder feedback from review of the identified key wildlife habitats and associated GCN species was also incorporated into the final working spreadsheet.

This process resulted in a list of 35 key wildlife habitat types for conservation purposes (Table 4.1). Each terrestrial key wildlife habitat usually contains more than one natural vegetative community that is similar in vegetative structure and characteristics in terms of wildlife habitat. However, some terrestrial habitats are essentially either unvegetated or rely on factors other than their sparse vegetation to define them (e.g., substrate) (Appendix 2).

**Table 4.1 Maryland's 35 Key Wildlife Habitats**

		PROVINCE OF OCCURRENCE				
#	KEY WILDLIFE HABITAT	AP	RV	PD	UCP	LCP
	<b>TERRESTRIAL &amp; WETLAND HABITATS</b>					
1	Old Growth Forests	X	X	X	X	X
2	Early Successional Forests	X	X	X	X	X
3	Maritime Forests and Shrublands					X
4	Loblolly Pine - Oak Forests				X	X
5	Mesic Deciduous Forests	X	X	X	X	X
6	Dry Oak - Pine Forests	X	X	X	X	X
7	Northern Conifer - Hardwood Forests	X	X	X	X	X
8	Floodplain Forests	X	X	X	X	X
9	Upland Depressional Swamps	X	X	X	X	X
10	Carolina Bays					X
11	Vernal Pools	X	X	X	X	X
12	Forested Seepage Wetlands	X	X	X	X	X
13	Bog and Fen Wetland Complexes	X		X	X	X
14	Nontidal Shrub Wetlands	X	X	X	X	X
15	Tidal Shrub Wetlands				X	X
16	Nontidal Emergent Wetlands	X	X	X	X	X
17	Tidal Marshes				X	X
18	Grasslands	X	X	X	X	X

		PROVINCE OF OCCURRENCE				
#	KEY WILDLIFE HABITAT	AP	RV	PD	UCP	LCP
19	Barrens and Dry Glades	X	X	X		
20	Cliffs and Rock Outcrops	X	X	X	X	X
21	Caves, Mines, and Springs	X	X	X	X	X
22	Coastal Beaches, Dunes, and Mudflats				X	X
	<b>STREAM &amp; RIVER HABITATS</b>					
23	Coldwater Streams	X	X	X		
24	Limestone Streams		X			
25	Highland Streams	X	X			
26	Piedmont Streams			X		
27	Coastal Plain Streams				X	X
28	Blackwater Streams				X	X
29	Highland Rivers	X	X			
30	Piedmont Rivers			X		
31	Coastal Plain Rivers				X	X
	<b>ESTUARINE &amp; MARINE HABITATS</b>					
32	Oligohaline Estuaries (low salinity)				X	X
33	Mesohaline Estuaries (medium salinity)				X	X
34	Polyhaline Estuaries (higher salinity)				X	X
35	Ocean					X

**Key: AP=Alleghany Plateau; RV=Ridge and Valley; PD=Piedmont; UCP= Upper Coastal Plain and LCP= Lower Coastal Plain**

Once the list of key wildlife habitats was compiled, the need for a more comprehensive wildlife information system and, more specifically, for geographic information system (GIS) mapping data addressing the distribution of the key wildlife habitats was determined. The current scientific inventory and geo-spatial databases were not sufficient to produce accurate distribution and status maps for all of the GCN species, their associated key wildlife habitats, or vegetative associations identified during the WDCP process. Since coarse-level habitat information is critical as a surrogate for some of the GCN species lacking adequate distribution and abundance data, the field inventories and analysis required to produce these resources remain a priority.

The first iteration of the distribution maps of Maryland's key wildlife habitats are included in this chapter, within each habitat section, for all but one of the 35 habitats. Insufficient data exists on the distribution of Forested Seepage Wetlands to create a meaningful first iteration map. GIS data layers have been developed for the purpose of generating a graphical representation of the general distribution of these habitats. These maps were compiled using existing data sources, such as USFWS National Wetlands Inventory data (NWI); USGS Mid-Atlantic Gap Analysis Program vegetation data (MDN-GAP), National Elevation Dataset (NED), National Hydrography Dataset (NHD), and Geographic Names Information System (GNIS); USDA Soil Conservation Service

generalized soils data (STATSGO); FEMA Q3 Floodplain data; MD Department of Planning's Land Use/Land Cover data; UMD Appalachian Environmental Lab (AEL) deep mines dataset; MD DNR MBSS/Versar Inc streams data (MBSS100k); and other DNR data provided by various sources, including Maryland Geological Survey (MGS), Resource Assessment Service (RAS) and Natural Heritage Program (NHP). The accuracy of these key wildlife habitat GIS data layers varies greatly, ranging from field-verified locations to predictive models, and many will need additional ground-truthing and other quality control measures and refinements before they should be considered accurate enough to use for most other purposes, especially at a local level.

However, these maps can be used as a tool to help direct distribution and abundance surveys of GCN species within these habitats and associated vegetative communities. The maps may also support the development of statewide strategies for specific key wildlife habitats on state and private lands designed to benefit all wildlife. Although the Biotics GIS system maintained by NHP contains location data for the rarest wildlife species in the state, predictive models of terrestrial vertebrate distribution developed in conjunction with the Mid-Atlantic Gap Analysis Program/USFWS/UMES provide the best overall distribution information for the remaining terrestrial vertebrate GCN species at this time (McCorkle, Gorham and Rasberry 2005). These data were used to compile the maps depicting the distribution of each major taxa group within Chapter 3. Further mapping of "ecological landscapes" and natural communities will identify and delineate land areas with similar topography, bedrock type, soils, surface hydrology, vegetation, and land use. This will allow improved analyses and prediction of the distribution of species and habitats of greatest conservation need within their ecological context and provide an important tool to assist in the conservation of unique habitats within the framework of natural biological systems.

## Threats and Conservation Actions

Maryland's wildlife and key wildlife habitats face formidable threats including habitat loss, degradation, fragmentation, disturbances (both natural and anthropogenic), pollution, etc.

There is clear consensus that the loss and degradation of viable wildlife habitat across the state from Maryland's human population increase and related development pressures remains the primary overarching threat to GCN species. A general discussion of threats is included in Chapter 1 and a summary of the overarching statewide threats to our wildlife and habitats is provided in Table 1.3. Threats and associated conservation actions that are best categorized as specific to certain wildlife taxa groups are included in Chapter 3. Those threats that pertain to the key wildlife habitats are listed in this chapter within each applicable key wildlife habitat section.

## How Conservation Actions were Developed

Potential conservation actions were initially identified from a wide variety of existing plans and resources, including those of MD DNR and other agency and non-profit conservation groups relevant to wildlife and habitat conservation in Maryland at the state,

regional, and national scales (Appendix 4a). Additional conservation actions were identified by staff during a review process to ensure that each threat had at least one related conservation action, as well as by various stakeholders during the WDCP input process to capitalize on the most current data and knowledge available.

To facilitate implementation of identified strategies and tasks, conservation actions are included at three levels: habitat-focused (affecting all species GCN within one or more key wildlife habitats), species-focused (addressing GCN species by taxonomic groups and provided in Chapter 3), and “other” (including policy-based actions and education/outreach). Each conservation action has specific detail to facilitate implementation. Potential key partners at the local, state, regional and national levels are also identified for conservation actions (Appendix 4b). Both staff and stakeholders were asked to provide input to determine the highest priority conservation actions, according to their effectiveness in addressing specific threats for the species and their habitats, and were given opportunity to provide input through a series of meetings, workshops, and review over the internet.

### **Statewide or Overarching Conservation Actions**

Conservation actions are organized in several ways to best address the needs of Maryland’s wildlife and its conservation. It is clear that conservation occurs at multiple scales, from the most specific population and local level to the more broad, statewide and overarching habitat and landscape scales. This chapter presents conservation actions across the spectrum of scales in order to capture the breadth of conservation needed in Maryland. First it presents the broadest, overarching, statewide actions, and then presents more specific habitat-focused actions for each of the key wildlife habitats.

During the process of identifying conservation actions for GCN species and key wildlife habitats, recurring patterns and issues crossed taxa and ecological boundaries. These critical “overarching” conservation actions were recognized to have broader impacts across taxa and habitats (see Table 4.2). This set of broad conservation actions best address the primary “overarching” threats previously identified in Chapter 1. Some of the identified strategies, such as comprehensive natural resource inventories and species/taxon surveys and life-history information collection by DNR staff, experts and partners, directly address the lack of a scientific knowledge base regarding habitat and associated wildlife species distribution, abundance, and condition. This new information is critical in determining limiting factors and habitat requirements to improve management for all GCN species across habitats. This information will also provide data for the identified need of GIS mapping and database management capacity that is so critical for monitoring and adaptive review of strategies.

**Table 4.2 Overarching Statewide Conservation Actions**

Secure adequate funding at the state, federal, local, and private levels to implement this Wildlife Diversity Conservation Plan, including developing mechanisms for wildlife diversity users to help fund this Conservation Plan
Maintain and disseminate appropriate data and GIS data layers on wildlife diversity and key wildlife habitats

Collaborate with partners and appropriate industries to implement this Conservation Plan
Utilize public outreach to increase awareness by the public of the value of wildlife diversity conservation and to garner public support for such
Develop recreational opportunities related to wildlife diversity to enhance public appreciation for the conservation of wildlife diversity and the key wildlife habitats that support them
Complete the development of Maryland's natural community classification and map spatially explicit locations for all natural community types using GIS technology
Identify the most important sites throughout the State for wildlife diversity conservation
Develop a core network of protected wildlife diversity conservation lands to capture the full array of Maryland's wildlife species
Develop mechanisms to ensure adequate connectivity of important wildlife diversity conservation sites
Establish effective laws, regulations, and ordinances at the local, state, and federal levels to conserve wildlife diversity
Fully implement all existing recovery plans for threatened and endangered species and species of conservation concern
Adequately enforce existing laws, regulations, and ordinances to protect GCN species
Enlist the support of elected officials at the state, local, and federal levels
Incorporate wildlife diversity conservation at the local land use planning level
Collaborate with sportsmen's organizations to effectuate wildlife diversity conservation
Collaborate with Chesapeake Bay conservation initiatives to incorporate wildlife diversity conservation into the efforts to "save the bay"
Develop and utilize incentives for private landowners to conserve key wildlife habitat on their lands
Utilize acquisition and easement programs to conserve high quality key wildlife habitat
Utilize existing environmental regulatory programs at the state, local, and federal levels to conserve key wildlife habitat
Develop and implement invasive species management programs to reduce or prevent impacts to GCN species and key wildlife habitats
Train staff, partners, private landowners, and elected officials on state-of-the-art wildlife diversity conservation science, techniques, and philosophy
Coordinate conservation actions at regional and national levels
Work with private landowners and public land manager to assist with appropriate management for key wildlife habitats and GCN species
Develop programs and strategies to monitor key wildlife habitats and the effectiveness of conservation actions

Many of these high priority overarching conservation actions are strategies and activities that are already being accomplished by DNR and its numerous partners. However, this WDCP will provide a new context or framework to understand the importance of those actions with regards to conserving the full array of Maryland's wildlife.

## **Maryland's Key Wildlife Habitats**

Following is a description of each key wildlife habitat, its location and condition, the threats to each habitat type, and the conservation actions and research, inventory, and monitoring needs that should to be implemented in order to abate those threats and conserve each habitat type and the associated wildlife species. Lists of associated GCN species and associated rare and unique natural communities, as well as some of the other wildlife species that DNR is currently managing, are also presented for each of the key wildlife habitats.

The list of threats has not been presented in any priority order. The same is true for the list of research, inventory, and monitoring needs. However the list of conservations actions has been grouped such that the highest priority actions are included at the top in bold text. There is no intentional additional order to the list (i.e., the sixth one listed is not necessarily the sixth most important action). This list of priorities was developed by summarizing the input worksheets from the July 2005 stakeholder workshop and comments received from the website. The WDCP development team reviewed the stakeholder priority results and provided further refinements.